


MASSACHUSETTS STATE POLICE FORENSIC SERVICES GROUP



DRUG UNIT PROTOCOL FOR MAKING STOCK SOLUTIONS Version 5.0

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Massachusetts State Police Forensic Services
Drug Unit
Protocol for Making Stock Solutions, v. 5.0
Effective Date: 11/10/2008
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FC-DRUGS-D013-V.5.0-9

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1 INTRODUCTION

This procedure establishes the guidelines to be used for making common stock solutions used.

2 SAFETY PRECAUTIONS

- 2.1 When working or visiting at any of the State Police Crime Laboratory facilities, all personnel and visitors shall comply with the established laboratory safety guidelines set forth in the "Massachusetts State Police Crime Laboratory Safety Manual." For reference, a copy of this manual is available at all Crime Laboratory locations. Refer to the Safety Manual for proper precautions.
- 2.2 Chemical exposure may pose the following hazards:
 - 2.2.1 Inhalation of volatile substances
 - 2.2.2 Inhalation of particulate matter
 - 2.2.3 Absorption via skin contact
 - 2.2.4 Mucous membrane exposure
 - 2.2.5 Sticks from hypodermic needles
- 2.3 Due to the potential hazards, appropriate precautions should be taken as necessary.
- 2.4 This includes, but is not limited to, the use of the fume hood, gloves, masks, and safety glasses.
- 2.5 Lab coats are to be worn at all times in the unit, unless performing administrative duties.

3 EQUIPMENT NEEDED TO MAKE STOCK SOLUTIONS

3.1 Any and all of the following equipment, or their equivalent, may be needed to perform this analysis:

- 3.1.1 Graduated Cylinders
- 3.1.2 Fixed or Adjustable Volume Pipettes
- 3.1.3 Glass Pipettes, Class A Volumetric
- 3.1.4 Volumetric Flask
- 3.1.5 Analytical Balance

4 MATERIAL NEEDED TO MAKE STOCK SOLUTIONS

4.1 Any and all of the following materials, or their equivalent, may be needed to perform this analysis:

- 4.1.1 Hydrochloric Acid (concentrated)
- 4.1.2 Sulfuric Acid (concentrated)
- 4.1.3 Nitric Acid (concentrated)
- 4.1.4 Sodium Hydroxide - 50% NaOH solution
- 4.1.5 Ethanol (ACS grade)
- 4.1.6 Vanillin
- 4.1.7 Cobalt Chloride
- 4.1.8 Promazine
- 4.1.9 Ammonium Thiocyanate
- 4.1.10 Deionized Water

- 4.1.11 Culture Tubes
- 4.1.12 Pipette Tips
- 4.1.13 Disposable Pipettes
- 4.1.14 Weighing Paper/Dishes
- 4.1.15 Methanol (ACS grade)

5 PROCEDURES FOR MAKING STOCK SOLUTIONS

5.1 3N Hydrochloric Acid Solution-One (1) Liter Preparation

- 5.1.1 Add approximately 500 milliliters deionized water to volumetric flask (1000 milliliters volume).
- 5.1.2 Slowly add 258 milliliters concentrated HCl to deionized water.
- 5.1.3 Add sufficient deionized water to make one liter (1000 milliliters) final volume.
- 5.1.4 Mix thoroughly.
- 5.1.5 Store in stock bottle at room temperature.

5.2 0.1 N Sulfuric Acid Solution-Two (2) Liters Preparation

- 5.2.1 Add approximately 1000 milliliters deionized water to volumetric flask (2000 ml volume).
- 5.2.2 Slowly add 5.6 milliliters concentrated H₂SO₄
- 5.2.3 Add sufficient deionized water to make one liter (2000 milliliters) final volume.
- 5.2.4 Mix thoroughly.
- 5.2.5 Store in stock bottle at room temperature.

5.3 Duquenois Reagent

- 5.3.1 Dissolve 4 grams of vanillin in 200 milliliters ethanol.
- 5.3.2 Add 600 microliters paraldehyde.
- 5.3.3 Mix thoroughly.
- 5.3.4 Store in a light sensitive amber glass bottle at room temperature.

5.4 10% Sodium Hydroxide Solution

- 5.4.1 Dilute 50% NaOH solution 1:4 with deionized water.
- 5.4.2 Mix thoroughly.
- 5.4.3 Store in stock bottle at room temperature.

5.5 20% Sulfuric Acid Solution

- 5.5.1 Dilute concentrated H₂SO₄ 1:4 with deionized water always adding acid to water.
- 5.5.2 Mix thoroughly.
- 5.5.3 Store in stock bottle at room temperature.

5.6 Cobalt Thiocyanate

- 5.6.1 Dissolve 6.8 grams cobalt chloride and 4.3 grams ammonium thiocyanate in sufficient deionized water to produce 100 milliliters final volume.
- 5.6.2 Mix thoroughly.
- 5.6.3 Store in a light sensitive amber glass bottle at room temperature.

5.7 2N Nitric Acid Solution

- 5.7.1 Add approximately 500 milliliters of deionized water to a volumetric flask (1000 milliliters volume).
- 5.7.2 Slowly add 125 milliliters HNO₃ to deionized water.
- 5.7.3 Add sufficient deionized water to make one liter (1000 milliliters) final volume.
- 5.7.4 Mix thoroughly.
- 5.7.5 Store in stock bottle at room temperature.

5.8 p-DMAB/Van Urk Reagent

- 5.8.1 Dissolve 2.0 grams of p-Dimethylaminobenzaldehyde (p-DMAB) in 50 milliliters of 95% ethanol.
- 5.8.2 Add 50 milliliters of concentrated hydrochloric acid.
- 5.8.3 Mix thoroughly.
- 5.8.4 Store in a light sensitive amber glass bottle at room temperature.

5.9 Procedure for making the Marquis Reagent (One-step reagent)

- 5.9.1 Add 100 milliliters of sulfuric acid to an amber glass bottle.
- 5.9.2 Add 1 milliliter of formaldehyde.
- 5.9.3 Mix thoroughly.
- 5.9.4 Store in a light sensitive amber glass bottle at room temperature.

5.10 Procedure for making the Mecke Reagent

- 5.10.1 Add 100 milliliters of sulfuric acid to an amber glass bottle.

5.10.2 Add 1 gram of selenious acid.

5.10.3 Mix thoroughly.

5.10.4 Store in a light sensitive amber glass bottle at room temperature.

5.11 Procedure for making the Promazine Stock Solution- (Approximate concentration 8.7mg/ml)

5.11.1 Add approximately 4.35 grams of Promazine to an amber glass bottle

5.11.2 Add 500 milliliters of Methanol.

5.11.3 Mix thoroughly.

5.11.4 Store in a light sensitive amber glass bottle in the refrigerator.

6 REVISION HISTORY

| REVISION DATE | VERSION | Approval | TOTAL PAGES | REVISION |
|------------------|---------|--|----------------|----------------------------------|
| | | Forensic Services Group Director | | |
| 9/1/1997 | 1.0 | Ken Gagnon, Carl Selavka | 5 | Original |
| 9/1/2002 | 3.0 | Ken Gagnon, Carl Selavka | 8 | |
| 3/9/2007 | 4.0 | Ken Gagnon, Carl Selavka | 4 | |
| 11/10/2008 | 5.0 | Al Elian, Ken Gagnon, Mary Kate McGilvray | 9 | Add Promazine stock solution. |

7 **MANUAL AUTHORIZATION**

APPROVED BY: SIGNATURES ON FILE IN QUALITY ASSURANCE UNIT

FORENSIC SERVICES GROUP DIRECTOR

DATE

LEAD SUPERVISOR FORENSIC CHEMISTRY

DATE

TECHNICAL LEADER FORENSIC CHEMISTRY

DATE

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